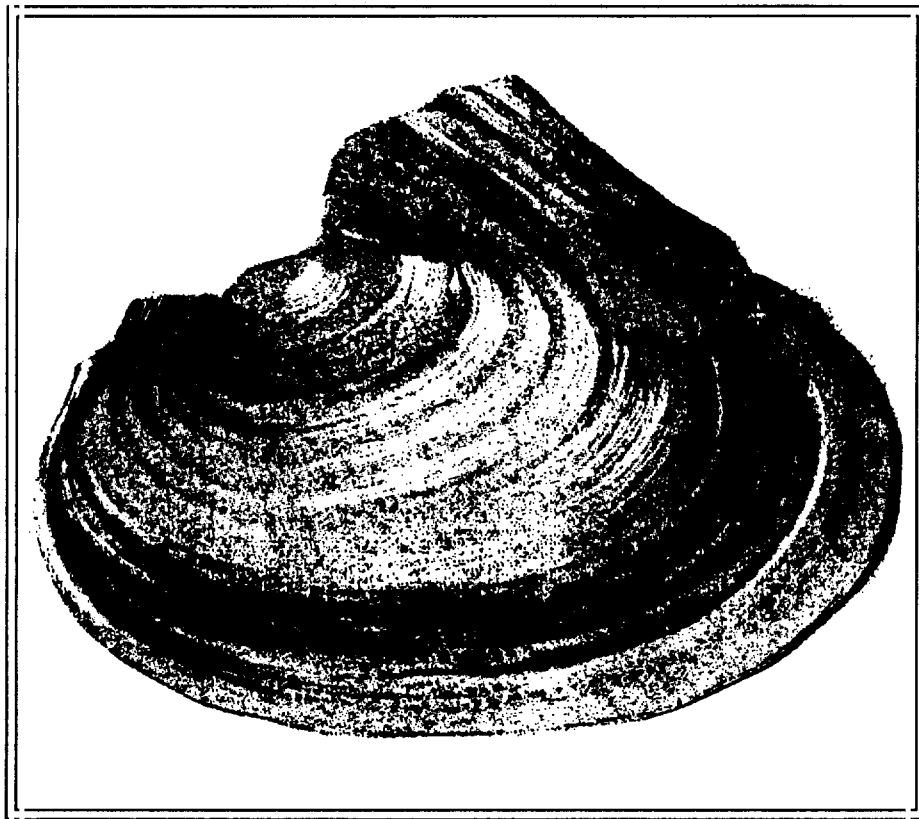


RECOVERY PLAN

Inflated Heelsplitter (*Potamilus inflatus*)



U.S. Fish and Wildlife Service



Inflated Heelsplitter

Potamilus inflatus

Recovery Plan

Prepared by

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for

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Approved: _____

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Date: _____

April 13, 1993

Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect the listed species. Plans are prepared by the U.S. Fish and Wildlife Service, sometimes with the assistance of recovery teams, contractors, State agencies, and others. Objectives will only be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Recovery plans do not necessarily represent the views nor the official positions or approvals of any individuals or agencies, other than the U.S. Fish and Wildlife Service, involved in the plan formulation. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species' status, and the completion of recovery tasks.

Literature citation should read as follows:

U.S. Fish and Wildlife Service. 1992. Inflated Heelsplitter, (Potamilus inflatus) Recovery Plan. U.S. Fish and Wildlife Service. Jackson, Mississippi. 15 pp.

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5430 Grosvenor Lane, Suite 110
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EXECUTIVE SUMMARY

Current Species Status: The inflated heelsplitter is listed as threatened and occurs in the Amite River, Louisiana, and the Tombigbee and Black Warrior Rivers, Alabama. It is threatened by sand and gravel mining in the Amite River and to a limited extent by channel maintenance in the Tombigbee and Black Warrior Rivers. It could be extirpated from the Amite River if sand and gravel mining continues to affect stream channel stability. Within the Tombigbee and Black Warrior Rivers, channel maintenance is a threat to the degree that mussel beds are covered with dredge disposal. The occasional inflated heelsplitter that is taken by a dredge is probably of little consequence to the entire population of this species.

Habitat Requirements and Limiting Factors: This species prefers a soft, stable substrate in slow to moderate currents. It has been found in sand, mud, silt and sandy-gravel, but not in large or armored gravel. As with other mussel species, fish hosts are likely required. The species which may serve as hosts are unknown. Conversion of habitat by impoundment, channel maintenance, and gravel mining has reduced the range of this species.

Recovery Objective: Delisting.

Recovery Criteria: The objective of this recovery plan is to delist the inflated heelsplitter, Potamilus inflatus. This may be accomplished when this species has a total of five viable self-sustaining populations that are fully protected and are so located that a single event is not likely to affect any two of them. At least one of the populations must occur in each of the three rivers that have current populations. Evidence of a stable or increasing self-sustaining population over at least 10 years is considered to be necessary for delisting.

Actions Needed:

1. Protect known populations and their habitat from further impacts.
2. Conduct life history research.
3. Investigate restoration of historic habitat and reestablish populations.
4. Develop and implement a plan to monitor all populations.

Total Estimated Cost of Recovery: Identified costs are \$810,000. However, some costs continue until the species is recovered and the cost of restoring habitat is not determinable at this time. Additional costs may occur if populations must be reestablished. These costs cannot be estimated until plans are developed for reestablishment of populations, if necessary.

Date of Recovery: Delisting may occur by the year 2005.

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PART I: INTRODUCTION

Description

The inflated heelsplitter was first described as Symphynota inflata by Lea in 1831. While the taxonomic status of this species has not been questioned in the literature, there has been considerable discussion of the appropriate generic name. It has been placed in Unio, Lampsilis, Metaptera, Margarita, Margarona, and Proptera, in addition to the other names discussed here (Simpson 1914, Clarke 1986, Hartfield 1988). Potamilus is accepted as the correct generic name by numerous authors (Morrison 1969, Valentine and Stansbery 1971, Clarke 1986, Turgeon et al. 1988). The common name in general usage for this species has been the Alabama heelsplitter. This recovery plan follows the common names as used in Turgeon et al. (1988) in support of the effort to standardize nomenclature of mussels.

The inflated heelsplitter has an oval, compressed to moderately inflated, thin shell. The valves may gape anteriorly, the umbos are low, and there is a prominent posterior wing that may extend anterior to the beaks in young individuals. The shell is brown to black and may have green rays in young individuals. The umbonal cavity is very shallow, and the nacre is pink to purple. Maximum shell length is about 140 millimeters (5 1/2 inches) in adults (Stern 1976). It is most similar to the pink papershell (Potamilus ohioensis), yet is easily distinguished by shell morphology (Hartfield 1988). The shell and teeth of the inflated heelsplitter are more delicate, and the shell is darker and has a pointed posterior, whereas the pink papershell has a rounded posterior. The inflated heelsplitter appears more inflated due to a more developed and rounded posterior ridge. The posterior wing of the inflated heelsplitter is more pronounced and abruptly rounded over the dorsum. The pink papershell may lack much of a wing, and when pronounced, it may be only slightly rounded and extend scarcely above the dorsum (Hartfield 1988). Lending further taxonomic strength to this species' distinction is the occurrence of the pink papershell in lakes and sloughs, while the inflated heelsplitter has not been found in these habitats. The U.S. Fish and Wildlife Service (Service) (1990) determined the inflated heelsplitter to be a threatened species on September 28, 1990.

Distribution

The inflated heelsplitter was known historically from the Amite and Tangipahoa Rivers, Louisiana; the Pearl River, Mississippi; and the Tombigbee, Black Warrior, Alabama, and Coosa Rivers, Alabama (Hurd 1974, Stern 1976, Hartfield 1988). The presently known distribution (Figures 1 and 2) is limited to the Amite River, Louisiana, and the Tombigbee and Black Warrior Rivers, Alabama (Stern 1976, Hartfield 1988). The collection of this species from the Pearl River by Hinckley was reported by Frierson (1911) and a single valve collected by Parker is housed in the U.S. National Museum (Dr. James Williams, U.S. Fish and Wildlife Service, pers. comm. 1988). There are no other reported collections from the Pearl River (Hartfield 1988). A single live specimen was collected from the

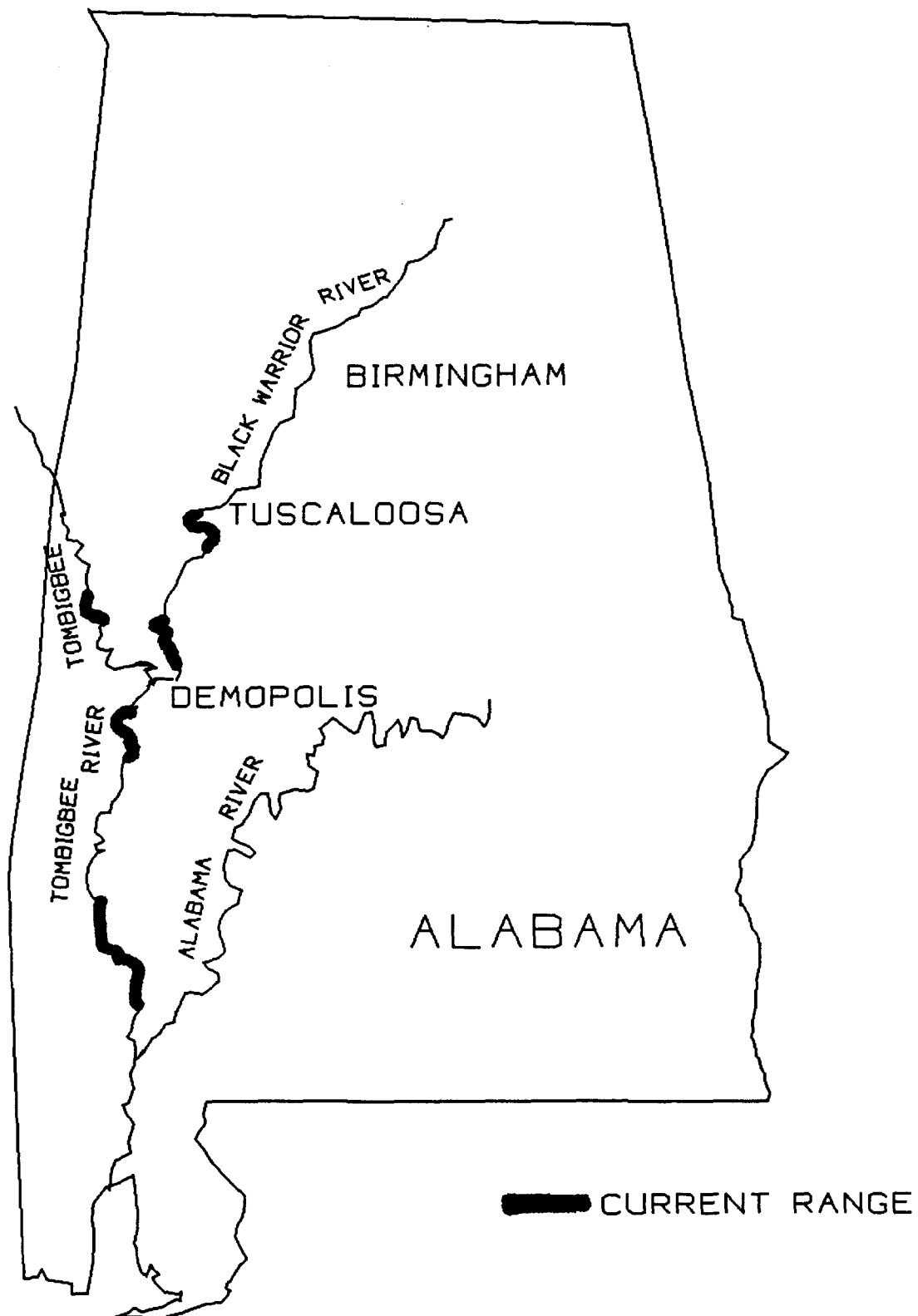


Figure 1 - Current Range of Inflated Heelsplitter
In Alabama

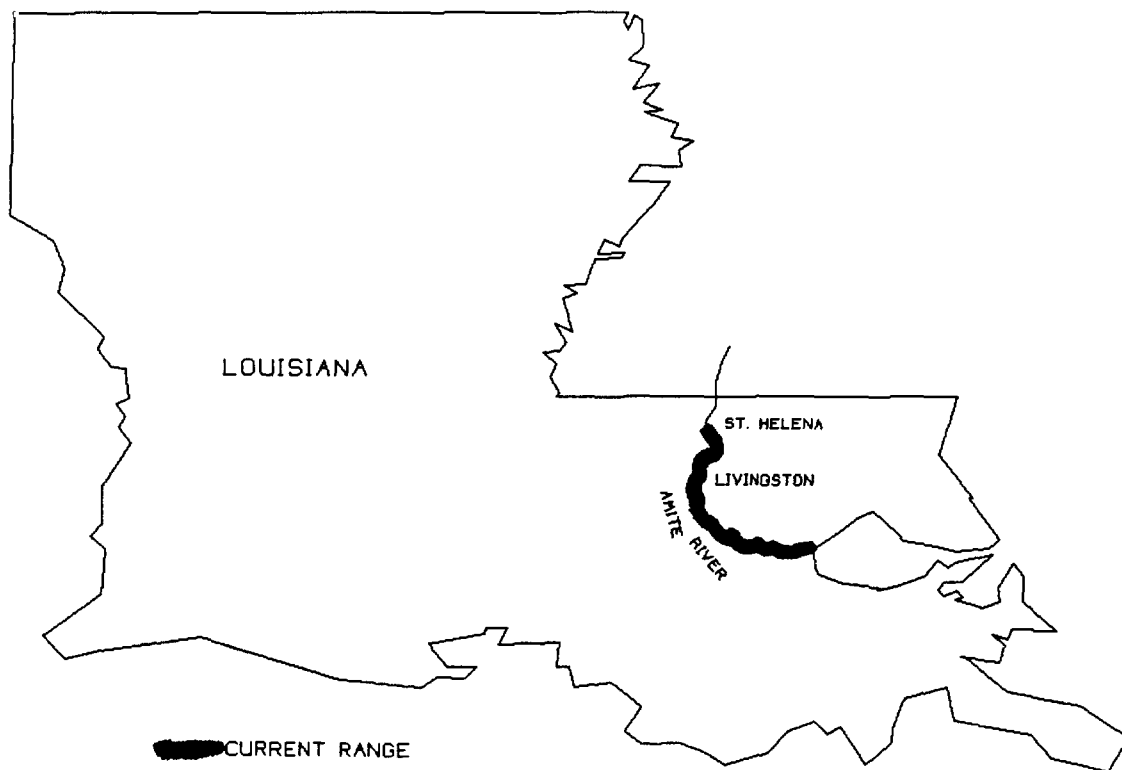


Figure 2 - Current Range of Inflated Heelsplitter
In Louisiana

Tangipahoa River, Louisiana, in 1964 by Stein and Stansbery (Dr. David Stansbery, Ohio State University, pers. comm. 1985). Hartfield (1988) did not find the species in the Tangipahoa River during his survey. Hurd (1974) doubted the occurrence of this species in the Coosa River based upon the single lot available in museums. Reports of Potamilus alatus from the Coosa River may actually be P. inflatus. However, neither species has been reported from the Coosa or Alabama Rivers in over 20 years (Hurd 1974, Hartfield 1988).

In the Amite River, the inflated heelsplitter occurs in the lower and mid reaches between State Highways 10 and 42 (Hartfield 1988). In the Tombigbee River, the inflated heelsplitter occurs in Gainesville Bendway; downstream of Coffeeville and Demopolis Dams; and in the vicinity of the Naheola Bridge (River Mile 173). It is likely the inflated heelsplitter occurs in any suitable habitat between Demopolis Dam and the downstream impoundment effects of Coffeeville Dam. In the Black Warrior River, this species is known to occur from Demopolis Lock 5 upstream to Selden Dam, near Eutaw, Alabama, and two individuals were recently discovered at River Mile 300.5 in Tuscaloosa County, Alabama. The increased range in the Tombigbee and lower Black Warrior Rivers is an expansion over that known when the inflated heelsplitter was listed and is the result of intensive surveys by Service biologists using SCUBA. The recent collection from the Black Warrior River, Tuscaloosa County, was by Dr. John C. Hall, Alabama Museum of Natural History (Stuart McGregor, Geological Survey of Alabama, in litt. 1992). The extent of this most recently discovered population is unknown.

Life History/Ecology

The preferred habitat of this species is soft, stable substrata in slow to moderate currents (Stern 1976). It has been found in sand, mud, silt and sandy-gravel, but not in large or armored gravel (Hartfield 1988). It is usually collected on the protected side of bars and may occur in depths over 6 meters (20 feet). The occurrence of this species in silt does not necessarily indicate that the life cycle can be successful in that substratum (Hartfield 1988). Adult mussels may survive limited amounts of silt, whereas juveniles would suffocate. The occurrence of this species in silt may be because it was established prior to deposition of the silt.

The life history of this species is largely unknown. Gravid females have been collected from the Amite River, Louisiana, during October (Hartfield 1988). At that time, they were observed to extend a mantle margin just above the substratum surface in shallow, clear water. This behavior is similar to some species of Lampsilis and has not been reported for any species of Potamilus. With the exception of these few observations, the life history is presumed to be similar to that of other unionids. During the spawning period, males discharge sperm into the water and females collect the sperm by the siphoning process. Eggs are fertilized and held in the females gills where they develop into larvae or glochidia. The glochidia are discharged into the water where they attach to a fish host, become encysted, and metamorphose into juvenile mussels that are capable of

surviving if they fall to suitable substrata. Mussels are also dependent upon the water currents to bring food particles within the range of their siphons.

Reasons for Listing

The inflated heelsplitter was listed because of habitat degradation that has resulted in the restriction of this species to limited stretches of three river systems and because of the continued threats to these populations. In the Amite River, there is a continued and serious threat from gravel mining that is largely unregulated. A proposed reservoir upstream of the range of this species may also have an adverse impact. The populations in the mainstem Tombigbee River are affected to a limited extent by channel maintenance activities. In addition, the population below Coffeerville Lock and Dam is not very abundant. The population in Gainesville Bendway may be adversely affected by the regulation of water flows from Gainesville Dam. This structure is designed to allow the passage of normal river flows with the exception of water needed for lockage. During low flows, there is little, if any, water released over Gainesville Dam spillway for varying periods of time. This could result in very low dissolved oxygen conditions on the river bottom in Gainesville Bendway and adversely impact the inflated heelsplitter.

Conservation Measures

Since the listing, Service biologists have extended the known range of this species in the Black Warrior and Tombigbee Rivers. Divers, using SCUBA, found this species in the Black Warrior River in the vicinity of Demopolis Lock 5 boat ramp (river mile 232-234.5) in deep water. On the basis of this find, the inflated heelsplitter likely occurs, where there is suitable substrata, in the entire 25 miles of the Black Warrior River downstream of Selden Dam. Also with the use of SCUBA, Service biologists found the inflated heelsplitter downstream of Demopolis Lock and Dam and in the vicinity of Naheola Bridge (River Mile 173) on the Tombigbee River. The species likely occurs in suitable habitat throughout the stretch between Demopolis Dam and the impoundment effects of Coffeerville Dam. Dr. John Hall collected two live specimens of the inflated heelsplitter from the Black Warrior River (River Mile 300.5), Tuscaloosa County, in 1992. Both specimens were photographed and returned to the river. It is likely the inflated heelsplitter is even more widespread in the mainstem Tombigbee and Black Warrior Rivers. Collections by Service biologists have been in deep water, sometimes of 30 feet or more. Service biologists have met with the New Orleans District Corps of Engineers to discuss gravel mining as a primary threat to this species in the Amite River in an effort to alleviate that threat through regulation. Service biologists are working with the Mobile District Corps of Engineers to provide protection for this species in the Tombigbee and Black Warrior Rivers. The discovery of additional populations of the inflated heelsplitter extends the protection of Sections 7 and 9 of the Endangered Species Act to those populations.

PART II: RECOVERY

A. Objective

The objective of this recovery plan is to delist the inflated heelsplitter, Potamilus inflatus. This may be accomplished when this species has a total of five viable, self-sustaining populations that are fully protected and are so located that a single event is not likely to affect two or more of them. At least one of the populations must occur in each of the three rivers that have current populations. Evidence of a stable or increasing self-sustaining population over at least 10 years is considered to be necessary for delisting.

Fully protected is defined as the implementation of protective measures, such as land management standards and guidelines for mussel habitat management, to ensure populations of this species remain at or greater than the five populations specified in the recovery objective. Protection will extend into the watershed, including public and private lands, to the point where activities in the watershed no longer adversely affect the stream.

A viable, self-sustaining population is defined as a population with the reproductive capability to sustain itself without immigration of individuals from other populations. Evidence of such a population is the presence of varying size classes of mussels and the common occurrence of young mussels.

B. Narrative Outline for Recovery Actions Addressing Threats

1. Protect the known populations and their habitats from further impacts. The most threatened population is in the Amite River, Louisiana. The Amite River population is in urgent need of protection. Stabilization of that system could bring this species close to recovery. However, populations in all three river systems must be protected.
 - 1.1 Use existing legislation to protect the range of known populations. Adverse impacts are continuing to reduce the range of this species. Existing Federal and State legislation can be used to monitor known populations and their habitat, and take corrective actions as warranted. Populations of this species continue to be adversely impacted and must be protected to prevent further declines that would warrant endangered status and danger of extinction.
 - 1.2 Develop and implement a management plan to protect the habitat. A plan to manage the habitat of the known populations should be developed and implemented. Since some or all of these populations are directly affected by actions of the U.S. Army Corps of Engineers, it will be important to

attain their input to and cooperation in the development and implementation of such a plan. The plan should consider ways to protect the existing populations, and restore or improve their habitat so that mussels become more numerous. This plan should include information from life history studies and protection of the fish host(s) and its ecosystem (Task 2). Specific tasks and methodology will be determined during plan formulation.

2. Conduct life history research on the species. While protecting adult mussels and the known habitats is of utmost importance, it is equally important that we know the life history requirements of the species if we are to ensure survival and recovery. This task should determine fish host(s), preferred habitats, water quality requirements, and other life history parameters. Survival is dependent upon protection of all aspects of the life history. For example, loss of the fish host(s) would result in loss of the species.

- 2.1 Characterize habitat. In order to protect this species in known habitat, we need to characterize the habitat for the more abundant populations. This would provide a standard by which other habitat can be compared.

- 2.2 Determine associated fish and mussel species. Mussel and fish species that are associated with Potamilus inflatus can be indicators of suitable habitat. A determination of associated species should be made. This should also provide information on potential fish hosts.

- 2.3 Develop life history data. Research to determine gametogenesis, fish host identification, age class structure, growth rate, life tables, and mortality factors should be done. Without this information, all efforts to recover this species, especially by artificial propagation, may be futile. This information will be beneficial in evaluating recovery of the species.

3. Determine the feasibility of restoring historic habitat and reestablishing the species. This species once existed in the Tangipahoa, Pearl, Coosa, and Alabama Rivers. If protection of less than five of the existing populations is not possible, it may be necessary to reestablish populations in currently unoccupied historic habitat to attain recovery.

- 3.1 Develop a plan to restore historic habitat. Populations of the inflated heelsplitter continue to exist in the Amite, Tombigbee, and Black Warrior Rivers. A plan should be developed to restore habitat to a condition that would allow range expansion and recolonization or reestablishment of the species. Priority areas are the Amite River where gravel

dredging has degraded habitat, Gainesville Bendway on the Tombigbee River, and the bendway below Selden Dam on the Black Warrior River. The area below Demopolis Dam in the Tombigbee River should be the next consideration, followed by other areas where the species currently exists, and then the Pearl, Tangipahoa, Alabama, and Coosa Rivers. The plan should include a determination of the water quality and habitat types, where this species is still abundant, to be used as a guide in restoring habitat in areas where it is less abundant or absent.

- 3.2 Develop a plan for reestablishing mussel populations. A plan for reestablishing mussel populations should be developed. This plan should include, but not be limited to determining the suitability of restored habitat by conducting trial transplants of closely related species; determining the feasibility of reestablishing Potamilus inflatus by artificial culture; and/or by transplanting from the larger populations; and methods of marking introduced individuals for survival determinations.
- 3.3 Implement plan to restore historic habitat. Based upon the information gained from Tasks 2.0, 3.1, and 3.2, the feasibility of reintroducing this species will be considered. If feasible, mussels should be reintroduced into restored habitat using methods in accord with the plan developed in Task 3.2.
4. Develop and implement a plan to monitor all populations. A plan to determine minimum population levels should be developed and implemented. This plan should be the basis for determining when individuals can be removed from the existing populations and when the species has reached a level at which it may be delisted. All populations should be monitored for a period of at least 10 years after they have attained the minimum population level developed by this task.
 - 4.1 Determine minimum population levels. Some minimum number of individuals is required for a self-sustaining population. A minimum of 500 individual mussels has been suggested in other recovery plans. This task will determine the minimum number of individual inflated heelsplitters required for a self-sustaining population.
 - 4.2 Develop a plan to monitor populations that have attained the minimum viable population level. This plan should include the minimum number of adults required in a self-sustaining population and the size classes required as evidence of sufficient recruitment. The frequency and method of monitoring over the 10-year period will be developed.

- 4.3 Implement the monitoring plan. The monitoring should be accomplished according to the plan developed in Task 4.2. All monitoring should be under the close supervision of someone with demonstrated expertise with freshwater mussels.

C. Literature Cited

- Clarke, A.H. 1986. Potamilus Rafinesque (1818) versus Proptera Rafinesque (1819) (Unionidae). Malacology Data Net. pp. 58-65.
- Frierson, L.S. 1911. A comparison of the Unionidae of the Pearl and Sabine Rivers. Nautilus 24:134-136.
- Hartfield, P. 1988. Status survey for the Alabama heelsplitter mussel, Potamilus inflatus (Lea, 1831). A report to the U.S. Fish and Wildlife Service. 27 pp. + Appendix.
- Hurd, J.C. 1974. Systematics and zoogeography of the unionacean mollusks of the Coosa River drainage of Alabama, Georgia, and Tennessee. Ph.D. Dissertation, University of Michigan, Ann Arbor. 240 pp.
- Lea, I. 1831. Observations on naiades, and descriptions of new species. TAPS V.4. pp. 99-100.
- Morrison, J.P.E. 1969. The earliest names for North American naiades. Annu. Rep. Am. Malacol. Union. pp. 22-24.
- Simpson, C.T. 1914. A descriptive catalogue of the naiades, or pearly freshwater mussels. Published by Bryant Walker, Detroit. 1540 pp.
- Stern, E.M. 1976. The freshwater mussels (Unionidae) of the Lake Maurepas-Pontchartrain-Borgne drainage system, Louisiana and Mississippi. Ph.D. Dissertation, Louisiana State University, Baton Rouge, LA. 206 pp.
- Turgeon, D.D., A.E. Bogan, E.V. Coan, W.K. Emerson, W.G. Lyons, W.L. Pratt, C.F.E. Roper, A. Scheltema, F.G. Thompson, and J.D. Williams. 1988. Common and scientific names of aquatic invertebrates from the United States and Canada: mollusks. Amer. Fish. Soc. p. 32.
- U.S. Fish and Wildlife Service. 1990. Endangered and threatened wildlife and plants; determination of threatened status for the inflated heelsplitter, Potamilus inflatus. Federal Register 55(189)38868-39872.
- Valentine, B.D., and D.H. Stansbery. 1971. An introduction to the naiades of the Lake Texoma region, Oklahoma, with notes on the Red River fauna (Mollusca, Unionidae). Sterkiana 42:1-40.

PART III: IMPLEMENTATION SCHEDULE

Priorities in column one of the following implementation schedule are assigned as follows:

1. Priority 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.
2. Priority 2 - An action that must be taken to prevent a significant decline in species population/habitat quality or some other significant negative impact short of extinction.
3. Priority 3 - All other actions necessary to meet the recovery objective.

Key to acronyms used in Implementation Schedule

FWE	- Fish and Wildlife Enhancement, U.S. Fish and Wildlife Service
RES	- Division of Research, U.S. Fish and Wildlife Service
EPA	- Environmental Protection Agency
ADCNR	- Alabama Department of Conservation and Natural Resources
COE	- U.S. Army Corp of Engineers
GSA	- Geological Survey of Alabama
LWF	- Louisiana Department of Wildlife and Fisheries

IMPLEMENTATION SCHEDULE										
PRIORITY #	TASK #	TASK DESCRIPTION	TASK DURATION	RESPONSIBLE PARTY			COST ESTIMATES* (\$K)			COMMENTS/NOTES
				USFWS		Other	FY 1	FY 2	FY 3	
				Region	Division					
2	1	Protect known populations	Continuous	4	FWE	EPA* COE	10	10	10	
2	2.1	Characterize habitat	3 years	4	FWE RES	ADCNR, GSA, COE, LWF	25	25	25	
2	4.0	Develop and implement monitoring plan	Continuous	4	FWE RES	COE, ADCNR, LWF	30	25	25	
3	2.2	Determine species associates	1 year	4	FWE RES	ADCNR, GSA, COE, LWF	15			
3	2.3	Develop life history data	3 years	4	FWE RES	ADCNR, LWF, GSA, COE	200	200	200	
3	3.1	Develop plan to restore habitat	1 year	4	FWE RES				5	
3	3.2	Develop plan to reestablish populations	1 year	4	FWE RES				5	
3	3.3	Implement plan to restore habitat	**	4	FWE RES	COE, ADCNR, LWF			**	Duration and costs will be determined in Tasks 3.1 and 3.2

* Includes only FWS funding

Part IV: APPENDIX

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